APPLICATION OF GEOGRAPHICAL INFORMATION SYSTEM ON VECTORS OF IMPORTANCE IN RELATION TO TROPICAL DISEASES IN THAILAND

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Geographical Information System (GIS) and related technologies such as remote sensing (RS) and Global Positioning System (GPS) are major tools for analyzing and controlling diseases. GIS can integrate and spatially analyze multisource data such as population, topography, hydrology, vegetation, climate, roads, and infrastructure. It strengthens the process of epidemiological surveillance information management and analysis, facilitates the display and analysis of spatial epidemiological data, and helps users choose between options when geographic distributions are part of the problem. Computerized maps increase the effectiveness of decision-making in epidemiology because an estimated approximately 80% of the information needs of local government decision makers relate to geographic location. Remote sensing data can provide large amounts of medically important information for analysis with GIS. GIS and remote sensing are historically and functionally linked, with the former providing tools for analyzing links between remote sensing or other spatial data and their related descriptive information. Mosquito-borne diseases are thought to have environmental components that can be monitored with remote sensing data. The most extensive use of GIS to study mosquito-borne diseases is that for research on malaria. Remote sensing data have been used to analyze the distributions of mosquitoes, identify mosquito breeding sites, predict malaria seasons, survey and control insect vectors for malaria. The ability of GIS to deal with large data sets and to incorporate remote sensing data has facilitated studies of environmental determinants of malaria, selection of areas according to specific characteristics, and production of malaria risk maps. In Thailand, satellite imagery was used to produce land coverage maps of vegetation patterns. GIS then analyzed land cover changes over time and mapped parameters contributing to malaria transmission by creating overlays of epidemiological, entomological, and environmental data on land cover data from different dates. A study in Thailand demonstrating the potential application of RS and GIS in assessing key malaria transmission factors will be discussed. The objectives of this study are to use RS and GIS to examine the temporal and spatial distribution of man-biting adult *Anopheles* mosquitoes to determine whether there is a link between adult mosquito distribution and location of larval habitats and to identify larval habitats that produce key vector species in order to target the control efforts. The capability of this advanced technology will also be discussed on other vector-borne diseases research in Thailand.

1st ASEAN Congress of Parasitology and Tropical Medicine and 40th Annual Scientific Seminar of MSPTM. Kuala Lumpur, Malaysia. 23-25 March 2004. (Keynote)